

CLAIMS

What is claimed is:

1. A method of recording audio, comprising:
 - storing user preference criteria;
 - identifying audio signals using a database of previously identified audio signals;
 - determining duration of the audio signals based on said identifying; and
 - saving a recording of the audio signals based on the user preference criteria and the duration.
2. A method as recited in claim 1,
 - wherein said identifying comprises:
 - extracting from the audio signals at least one candidate fingerprint using at least one technique; and
 - comparing the at least one candidate fingerprint with at least one database of reference fingerprints for identified recordings, and
 - wherein said method further comprises supplying identification data corresponding to at least one reference fingerprint that said comparing finds matches the at least one candidate fingerprint and the duration.
3. A method as recited in claim 2,
 - wherein said extracting uses a plurality of techniques to extract a plurality of candidate fingerprints, and
 - wherein said comparing uses the plurality of candidate fingerprints.
4. A method as recited in claim 3, wherein said determining the duration comprises:
 - detecting a candidate length of at least part of the recording; and
 - comparing the candidate length with reference lengths of the identified recordings.
5. A method as recited in claim 4, wherein said saving replaces a previous recording if said identifying matches the audio signals with one of the identified recordings which also matches the previous recording and the audio signals are perceivable as having better quality than the previous recording.

6. A method as recited in claim 4,
further comprising sending at least the plurality of candidate fingerprints and
playing time information from a client device performing said saving to at least one server
device storing the at least one database,
wherein said comparing is performed by the at least one server device, and
wherein said supplying is performed via a network transmitting the identification
data from the at least one server device to the client device.
7. A method as recited in claim 4, wherein the identification information includes at least
one of artist, genre and rating.
8. A method as recited in claim 7, wherein said saving includes comparing the at least
one of artist, genre and rating in the identification data with the user preference criteria to
determine whether to save the recording of the audio signals.
9. A method as recited in claim 3, wherein the plurality of techniques include both digital
fingerprints and analog fingerprints.
10. A method as recited in claim 2, wherein said saving further includes saving the
identification data with the recording.
11. A method as recited in claim 10,
wherein said saving is performed for a plurality of recordings, and
wherein the identification information includes at least one of artist, genre and
rating.
12. A method as recited in claim 11, further comprising modifying the user preference
criteria based on at least part of the identification information saved with the recordings.
13. A method as recited in claim 11, further comprising notifying a user of currently
broadcast audio signals matching the user preference criteria.

14. A method as recited in claim 11, further comprising:
 - receiving at least one parameter from a user; and
 - automatically generating a playlist of at least one of the recordings based on the at least one parameter.
15. A method as recited in claim 1, further comprising:
 - receiving the audio signals at a local device from a remote device; and
 - temporarily storing the audio signals as the recording until said identifying is completed.
16. A method as recited in claim 15, wherein the audio signals are received as analog signals via a first radio broadcast on a first frequency.
17. A method as recited in claim 15, wherein said method further comprises converting the analog signals to digital signals prior to said identifying.
18. A method as recited in claim 15, further comprising outputting different audio signals from a different source to a user during said receiving.
19. A method as recited in claim 18, further comprising receiving the different audio signals via a second radio broadcast on a second frequency during said receiving of the first radio broadcast.
20. A method as recited in claim 19, further comprising providing a user interface for determining the audio signals received via the first radio broadcast regardless of whether the different audio signals are being output.
21. A method as recited in claim 20, wherein said providing includes a manual interface on the local device.
22. A method as recited in claim 20, wherein said providing is performed on a programming device separate from the local device.

23. A method as recited in claim 22,
wherein the local device and the programming device are connected via a network, and
wherein said providing includes accepting input from the user regarding at least one of broadcast time, a radio station broadcasting the audio signals, radio station format, genre of broadcast audio, popularity of broadcast audio, location of broadcaster, year of broadcast, language of broadcast and minimum quality of the audio signals.

24. A method as recited in claim 20, wherein said providing includes displaying program information about audio signals broadcast on the second frequency.

25. A method as recited in claim 15, further comprising outputting different audio signals from a different source to a user during said receiving.

26. A method as recited in claim 25, further comprising:
identifying the different audio signals; and
saving identification information matching the different audio signals as listening habit information.

27. A method as recited in claim 26, further comprising modifying the user preference criteria based on the listening habit information.

28. A method as recited in claim 26, further comprising notifying a user of currently broadcast audio signals matching at least one of the user preference criteria and the listening habit information.

29. A method as recited in claim 25, further comprising scanning a plurality of different sources for currently broadcast audio signals matching the user preference criteria.

30. A method as recited in claim 25, wherein said receiving uses at least one computer network for transmission of a digital audio stream.

32. A method as recited in claim 25, further comprising:
identifying the different audio signals; and

automatically switching output of the different audio signals to the user from the different source to alternative audio signals from an alternative source if the different audio signals are recognized as undesired by the user.

33. A method as recited in claim 32, further comprising:

continuing to identify the different audio signals from the different source while outputting the alternative audio signals to the user; and

automatically switching output to the user back to the different audio signals from the different source when the different audio signals are identified as desired by the user according to at least one of the user preference criteria and listening habits of the user.

34. An apparatus for identifying and recording audio, comprising:

at least one storage unit to store user preference criteria and recordings with associated identification information; and

at least one processor, coupled to said at least one storage unit, to identify audio signals using at least one database of previously identified audio signals, determine duration of the audio signals based on identification thereof, and control saving of a recording of the audio signals in said at least one storage unit based on the user preference criteria and the duration.

35. An apparatus as recited in claim 34,

wherein at least one audio recognition service external to said apparatus maintains the at least one database of previously identified audio signals, and

wherein said apparatus further comprises at least one interface coupled to said at least one processor and the at least one audio recognition service.

36. An apparatus as recited in claim 35,

wherein said at least one processor extracts from the audio signals at least one candidate fingerprint using at least one technique, and

wherein the at least one audio recognition service compares the at least one candidate fingerprint with the at least one database of reference fingerprints for identified recordings, and sends to said at least one interface identification data corresponding to at least one reference fingerprint that matches the at least one candidate fingerprint and the duration.

37. An apparatus as recited in claim 36,
wherein said at least one processor extracts a plurality of candidate fingerprints using a plurality of different techniques, and
wherein the at least one audio recognition service compares the plurality of candidate fingerprints with a plurality of databases of reference fingerprints

38. An apparatus as recited in claim 35, wherein the at least one audio recognition service extracts from the audio signals at least one candidate fingerprint using at least one technique, compares the at least one candidate fingerprint with the at least one database of reference fingerprints for identified recordings, and sends to said at least one interface identification data corresponding to at least one reference fingerprint that matches the at least one candidate fingerprint and the duration.

39. An apparatus as recited in claim 34, further comprising at least one receiver, coupled to said at least one processor, to receive at least some of the audio signals as broadcast radio.

40. An apparatus as recited in claim 39, further comprising at least one interface, coupled to said storage unit, to receive at least some of the audio signals from a local playback device.

41. An apparatus as recited in claim 39,
wherein the at least one receiver includes at least two tuners for receiving the broadcast radio on at least two frequencies, and
wherein the at least one processor automatically controls at least one of the tuners according to programmed instructions.

42. At least one computer readable medium storing instructions executable by at least one processor to perform a method of recording audio, comprising:
storing user preference criteria;
identifying audio signals using a database of previously identified audio signals;
determining duration of the audio signals based on said identifying; and
saving a recording of the audio signals based on the user preference criteria and the duration.

43. An apparatus for identifying and recording audio, comprising:
- storage means for storing user preference criteria and recordings of audio signals; and
 - identification means for identifying audio signals using a database of previously identified audio signals and for determining duration of the audio signals based on said identifying, said storage means saving a recording of the audio signals based on the user preference criteria and the duration.